



Influence of different colour mulching on growth and yield of crop

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Abstract

The colour of plastic mulch influences growth and yield of a particular crop. Plastic mulches has advantage of greater marketable yield (upto 24 to 65% increase) compared to bare soil, which is because of conservation of moisture, improved microclimate both beneath and above the soil surface, light reflection and great weed control. Because of imperviousness of plastic mulches, it prevents direct evaporation of moisture from the soil and thus limits the water losses and soil erosion over the surface. The colour of plastic mulch influences crop growth and yield by altering amount of upwardly reflected light from mulch surface upto plant canopy. These radiation changes has marked effect on plant light environment and consequently on growth as well as yield of crop.

The colour of plastic mulch is one of the most important factor influencing growth and yield of various crops. Mulch has many advantages such as moisture conservation, control the weed, reduces nutrient losses, improves hydrothermal regimes of soil etc. The greater marketable yield is observed with the use of plastic mulches (upto 24 to 65% increase) compared to bare soil. Besides these advantages particular colour of mulch has special advantage to the particular crop. The mulch colour may affect effective weed seed germination, growth, and development under the plastic mulch. The use of black polyethylene mulch in vegetable production has been reported to control the weed incidence and improves the hydrothermal regimes of soil. The silver/black and black plastic mulch controls weeds by 95 to 98% (Rajablariani, 2012).

The different colour mulches like yellow, grey, blue reflect different radiation patterns back into the canopies of various crops which affect plant growth and development in many ways. Some colours attract certain insects, such mulches might be used in a field to grow “catch crops” to pull insects away from other crops. Thus different crops responds differently to specific colour of mulch. Hence there is need to adopt specific colour mulch for particular crop. Tomatoes in red mulches observed to set fruit earlier and produced more ripe fruit. Biomass accumulation and flower and fruit production were also affected by mulch colour treatments and may be due to mulch effects on the plant light environment and/or root zone temperatures. The colour of plastic mulch influences crop growth and yield by altering amount of upwardly reflected light from mulch surface upto plant canopy. These

light changes has marked effect on plant light environment and consequently on growth as well as yield of crop.

Soil temperature: Due to plastic mulch soil temperature observed to be increased from 3.3 to 6.6°C as compared to without mulch or bare soil. Soil warming at early spring provided suitable conditions for growth of tomato seedlings and earliness, but also weeds germinated and grew under plastic. Reduced temperature under the light colour mulch at the end of growing season increased plants survival.

Biometric observations: Increased FR: R ratio might be attributed to increased plant height. References shown that, blue light reflected from the plastic mulches could have improved okra growth and yield. In red bell pepper, plants grown in red mulch were taller than the other coloured mulch treatments. The plants grown on blue colour mulch increased no. of branches. Mulches improves microclimate conditions that might be attributed to increased number of leaves in plants. References reported that, lettuce (*Lactucasativa*) grown on red mulch had most number of leaves compared to the other coloured mulch treatments.

The marketable yield is lower in weedy plots due to severe competition of weeds with crop. Quality parameters of fruit crops generally not affected by mulch colour.

Photosynthetically Active Radiation (PAR) : The upwardly reflected light from mulch surface categorized as Photosynthetically Active Radiation (PAR) and Photomorphogenic light (FR: R ratio). Different colour mulches reflects different amount of PAR. Growth of plants is highly influenced by PAR absorbed by leaves. Generally light colour mulches more amount of

PAR than darker colour mulches. Plants generally respond to increase in FR: R ratios by becoming taller and shifting biomass to the aerial portion of the plant, while they respond to PAR by producing more chemical energy and sugar in the process of photosynthesis. PAR ranges from 400 to 700 nm and FR ranges from 700 to 800 nm.

Conclusion: The different colour mulches reflect different radiation patterns and different amount of PAR back into the canopies of various crops which affect plant growth and development. Different crops respond to specific colour of mulch in different way. Specific colour mulch is

more suitable and advantageous to particular crop. Thus, there is need for detailed evaluation of spectrum reflected by colour mulch back into the canopy as well as to use particular colour mulch for specific crop.

References:

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